

# Interfacing with Large-Scale Neuronal Ensembles

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### Objective

Construct an interface which enables the delivery of synthetic inputs directly into sensory and memory systems of the brain and allows direct, remote access to the outputs of these systems in biological organisms performing high level information processing.

### Approach

- Monitor neural patterns
  - Evaluate high-level neural signal processing in sensory, memory, and planning regions of the brain
- Neural Circuit Programming
  - Introduce synthetic sensory inputs into high-level neural systems with targeted computer stimulation
  - Integrate applied artificial neural signals with natural brain waves to allow training optimization
  - Use externally applied control signals to guide specific behaviors
  - Develop technique for remote task command & control

### Schedule

- 1998 Setup and parameter configuration.
- 1999 Begin high-bandwidth telemetry design. Begin implementation of low-bandwidth telemetry system. Begin neural pattern control and navigation experiments.
- 2000 Low-bandwidth telemetry in place. Complete neural control experiments. Begin neural pattern recognition experiments.
- 2001 Full high-density interface with telemetry completed. All experiments completed.